Finite-Difference Solver Based on Field Programmable Interconnect Devices

Abstract of Disclosure

A method for solving a wide variety of linear partial differential equations by exploiting the normally undesirable parasitic resistances present in flexible digital switching components. The terminal relationships of these field programmable interconnect devices can be manipulated under program control to directly mimic the nodal relationships defined in finite difference method models of a partial difference equation problem. Adding ADCs/DACs to automate the solution process can extend the method of analog equation solving. It is also possible to segment larger problems using this approach, feeding sections into the device and injecting/capturing voltages as appropriate to produce an overall solution that will eventually converge after a number of presentation / solution sub-cycles.

Figures